

# PATENT ABSTRACTS OF JAPAN

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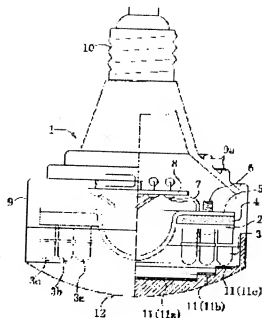
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## (54) ILLUMINATING LAMP

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a general-purpose illuminating lamp capable of achieving excellent illumination at low costs, and easily obtaining desired color tones.

**SOLUTION:** The illuminating lamp is provided with a plurality of LEDs arranged toward a specified direction so as to turn on lights, and one or one set of phosphors is provided in front of the specified direction toward which a plurality of LEDs are arranged so that at least a part of the illuminating light from the LEDs are converted in wavelength by the phosphor and radiated externally. In the illuminating lamp, the light from the LEDs are converted by the phosphor provided in the illuminating light direction of the LEDs arranged in plural, and illumination is achieved by the converted illuminating light, thereby illuminating light having desired color tone can be obtained easily by arranging a phosphor corresponding to an LED used. The LEDs used in this case are not limited to high-cost LEDs such as a white LED or the like, and the phosphor is not required to be provided for individual LED, thereby entire illuminating lamp can be achieved at low costs.



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**CLAIMS**

[The scope of a claim for utility model registration]

[Claim 1] In what attached a reflecting-cylinders object to the upper part of a cap, and attached a substrate made to carry a semiconductor device like [ so that heat conduction is possible ] a light emitting diode in an inside of a reflector formed in this reflecting-cylinders inside of the body, A LED lamp being the thing of construction material excellent in insulation like a ceramic material, and heat dissipation nature, and constituting said reflecting-cylinders object.

[Claim 2] The LED lamp according to claim 1 which provides a divider plate in a reflecting-cylinders inside-of-the-body part, and is characterized by making a lead hang from a substrate on both sides of this divider plate in between.

[Claim 3] The LED lamp according to claim 1 having constituted a reflector formed in the reflecting-cylinders inside of the body in reverse truncated cone shape, and having made an inclination loose and installing in the upper part of a reflecting-cylinders object.

**DETAILED DESCRIPTION**

[Detailed explanation of the device]

[0001]

[Industrial Application]

This device is applied when two or more light emitting diodes and other semiconductor devices are made to approach and carry to up to a small substrate, and it is related with a suitable LED lamp.

[0002]

[Description of the Prior Art]

Conventionally, what attached the reflecting-cylinders object made of a synthetic resin to the upper part of a cap, and attached the substrate which formed the reflector in the inside of this reflecting-cylinders object, and was made to carry a semiconductor device like two or more light emitting diodes and the rectifier diode which constitutes that rectification circuit in the inside of this reflector is publicly known.

[0003]

However, from thermal conductivity being missing and sufficient heat dissipation not being performed, a synthetic resin. The problem of shortening a life arose by being unable to miss well the heat generated from the semiconductor device of a light emitting diode or others at the time of electric conduction, but the internal temperature of a reflector rising, reducing the luminous efficiency of the semiconductor device of a light emitting diode or others, and degrading character further.

[0004]

Then, as shown in drawing 1 and drawing 2, the reflecting-cylinders object 1 is constituted from a conductive material excellent in thermal conductivity like aluminum or brass. What formed the reflector 2 in this reflecting-cylinders object 1 inside, attached the substrate 3 made to carry a semiconductor device like two or more light emitting diodes or a rectifier diode in this reflector 2 inside so that heat conduction was possible, and attached the reflecting-cylinders object 1 to the cap 5 via the tubed insulating member 4 was developed.

[0005]

Since it has heat dissipation nature with the expensive reflecting-cylinders object 1, the temperature of the substrate 3 does not rise but this thing raises luminous efficiency. Since the reflecting-cylinders object 1 exposed to the exterior was insulated via the cap 5 and the insulating member 4 when a product life can be lengthened and also it attaches, had the advantage that problems, such as fault current and a short circuit, did not arise, but it was safe, but. The problem that a manufacturing cost cost dearly for the time and effort which cuts a reflecting-cylinders object, the insulating member which becomes excessive, and its attachment arose.

[0006]

[The issue which a device should solve]

Even if the reflecting-cylinders object attached to the cap is used for the purpose of this device, it excels in heat dissipation nature, and it is to use as an offer plug the anxious LED lamp of fault current or a short circuit which is not.

[0007]

[Means for Solving the Problem]

In what this device attached a reflecting-cylinders object to the upper part of a cap in order to attain the purpose mentioned above, and attached a substrate made to carry a semiconductor device like [ so that heat conduction is possible ] a light emitting diode in an inside of a reflector formed in this reflecting-cylinders inside of the body, A LED lamp being the thing of construction material excellent in insulation like a ceramic material, and heat dissipation nature, and constituting said reflecting-cylinders object.

[0008]

In that case, this device provides a divider plate in a reflecting-cylinders inside-of-the-body part, make a lead hang from a substrate on both sides of this divider plate in between, or it constitutes a reflector formed in the reflecting-cylinders inside of the body in reverse truncated cone shape, and can make an inclination loose and can install it in the upper part of a reflecting-cylinders object.

[0009]

[Function]

The temperature of a substrate is prevented from rising by the Joule heat generated from the semiconductor device of a light emitting diode or others at the time of electric conduction getting across to a reflecting-cylinders object via a substrate, and radiating heat to the propagation exterior also to a cap further. Since a reflecting-cylinders object is insulating construction material simultaneously, neither a short circuit nor fault current is produced via a cap or a reflecting-cylinders object.

[0010]

If the divider plate which divides the lead of a couple into a reflecting-cylinders inside-of-the-body part is provided, heat dissipation which a possibility that a lead comrade's contact may be prevented thoroughly and the short circuit from this field may arise does not have, and also passes this divider plate can also be aimed at.

[0011]

If a reverse truncated cone-shaped reflector is formed in the upper part of a

reflecting-cylinders object and it moreover inclines loosely, heat dissipation from the upper part of a reflecting-cylinders object can also be aimed at.

[0012]

[Example]

A drawing shows one example of this device and 10 is a cap in drawing 2 thru/or drawing 5. The lower part 11a which the reflecting-cylinders object 11 which was excellent in insulation like a ceramic material, and was constituted from a thermally conductive good material constituted in the byway a little was made to insert in the opening upper part of this cap 10, for example, it has adhered with the room-temperature-setting nature epoxy resin. As for this reflecting-cylinders object 11, the reflector 12 of the loose reverse truncated cone shape of an inclination is formed in that upper part, the light emitting diodes [ lower part / of this reflector 12 ] 13 and 13 of plurality [ upper part ] ... and the rectifier diodes 14 and 14 -- the substrate 15 in which semiconductor devices, such as ..., were made to carry and which similarly comprises a ceramic material was attached, and it has adhered with thermoset epoxy resin.

[0013]

And each semiconductor device made to carry in the upper surface of the substrate 15 is resin \*\*\*\*\* by the transparent thermoset epoxy resin 16.

[0014]

The divider plate 17 is formed in reflecting-cylinders object 11 inside at one, and it is divided by this divider plate 17, and each leads 18a and 18b made to hang from the substrate 15 are considered so that it may not contact mutually. Among [ 18a ] each of this lead, it is connected to the inner portion of the cap 10, and 18b is connected to the eyelet 20 via the ballast resistance 19.

[0015]

[Effect of the Device]

Since the Joule heat generated on a substrate can be made to radiate heat efficiently to the exterior via a reflecting-cylinders object with little easy composition of part mark which assembled and is easy to carry out if constituted like claim 1, A short circuit and fault current can be thoroughly prevented from arising via the reflecting-cylinders object which can raise luminous efficiency, can prevent degradation of an element, and can prolong a life substantially, and also is exposed to the exterior at the time of use.

[0016]

Since a ceramic material can be made with shaping, it can fully respond also to a complicated-shaped thing.

[0017]

If constituted like claim 2, the accident which can aim at heat dissipation through a divider plate, and also each lead contacts inside a reflecting-cylinders object or a cap can be prevented effectively.

[0018]

When constituted like claim 3, it has an advantage which can aim at heat dissipation from the upper part of a reflecting-cylinders object.

## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a front view of the conventional LED lamp.

[Drawing 2] It is drawing of longitudinal section for explaining the internal structure of the conventional LED lamp.

[Drawing 3] It is a front view of the LED lamp concerning this device.

[Drawing 4] It is drawing of longitudinal section for explaining the internal structure of the

LED lamp concerning this device.

[Drawing 5] It is a circuit diagram of the LED lamp concerning this device.

[Description of Notations]

10 Cap

11 Reflecting-cylinders object

12 Reflector

13 Light emitting diode

15 Substrate

17 Divider plate

18a Lead

18b Lead